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# LOW-COST, ONE-FAMILY HOUSING ADAPTED TO LOCAL SOCIAL, ECONOMIC AND TECHNICAL CONDITIONS

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# Low-cost, One-Family Housing Adapted to Local Social, Economic and Technical Conditions

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The great extension of urbanization in developing countries makes housing a problem of the key importance.

The present housing shortage makes immediate decisions in this matter imperative, while the extreme disproportion between requirements and the available means and manpower calls for the most careful consideration of the problem and the elaboration of an organisational policy and of its realisation.

The individual character of the structure of towns and settlements in developing countries, quite different from that of the industrialized countries, requires the elaboration of specific individual methods of solution.

These methods should take in consideration the geographical situation of the given country, its climate, traditions and social structure, degree of economic development, and particularly its present sources of material and manpower.

In consequence the realisation of investment programmes should be based on completely new models, individually elaborated for particular countries and specified both from the point of view of physical and technical planning.

1. The expansion-planning of towns in the discussed areas, dating as a rule from second half of the 19th century, was usually nothing but a mechanical transposition of European lay-outs to those territories.

Town planning in the period after the first and even the second world war, generally enhanced these disparities even in the up-to-date planning and architectural systems.

The most difficult problem will be a complex definition of forms of modernization of the regressive and outdated structures of the old urban centres, and of the forms of construction of new towns, or new districts in the developing regions, adequate for new forms of social life.

A proper solution of these problems will be of major importance for the societies in question, and will greatly influence the shaping of new social structures and national mentality.

Even the best examples, taken indiscriminately from industrialised countries, cannot be considered as a basis in these cases.

2. The most difficult problems to be solved will be a proper elaboration of programmes and appropriate town-planning models.

The situation is complicated by the necessity of taking into consideration the present and envisaged living standard and the traditional, but evolving structure of family life.

Our experience in building in the countries of North Africa confirms that it is still in many cases of enormous significance to isolate individual buildings from outside and from each other. It is also important to separate the inner life of the house from visitors /guest rooms/. Thus the arrangement of the rooms and the connection between them arises from this need. The necessity to take these problems into consideration will be more important in Libya, than, for example, in Tunisia, where the evolution of social structural forms has been more developed. In consequence in the building sets in Libya the strict separation from each other, also of the inner courts will be necessary.

Another basic postulate is the necessity for a clear definition of the occupants of these buildings - i.e. the social classes for which the buildings are being erected.

The problem is of the greatest importance as it influences such basic complex factors as:

- the choice of locality for the building estates and the size of lots
- the size of dwellings and their functional design
- the exterior and interior equipment of dwellings and even the technology and methods of realization.

It may be important to gauge the opinions of the future occupants of the buildings, before and after they move in, respecting their views by the use of a questionnaire.

In consequence it will be necessary to take into consideration as widely as possible such problems as:

- the elaboration of programmes and standards for dwellings
- the scope of public-utility buildings and the technical equipment of estates
- the definition of the principles of town planning and architectural systems.

For final and transitional dwelling standards the necessary minimum should be definitely given, both in general and in detail, with particular consideration to the first stage.

Equipment in public-utility buildings demands the reservation of proper areas for buildings which have to be erected simultaneously with the development of the economy and of new social structures, as for instance, creches and nursery schools required by the vocational employment of women. For the same reason the possibility of a gradual extension of such buildings should be considered so as to be in line with the increase in the needs of the population.

Considering the above-mentioned dynamic social changes the introduction of the most adaptable solutions is indispensible.

3. In defining the principles of town planning it should be stressed that considerable economy may be achieved by adopting a proper urban-planning system.

Terrace buildings may be accepted as being the most desirable form of construction in many of the countries with which we are concerned. This applies in particular to the atrium type, which is, in any case, traditional for a number of regions.

The reluctance shown on many occasions to this type of construction arises partly from the tendencies in some countries to abandon the atrium-type building in favour of one-family, detached houses which are considered to be synonymous with social progress.

Nevertheless this system of atrium building, of such long historical traditions, is now being reintroduced in a number of European countries of the highest residential culture, where it is highly valued, for its economy and for the fact that it gives the maximum privacy at low cost. This one-storey building system provides for almost as many occupants per hectare as does the two to three-storey type of detached houses.

Apart from the price of the building site which is greatly reduced with the decrease in area of the plots, the cost of construction of roads and the sanitary equipment of the site will be, in this case, reduced three to five-fold as compared to one-family dispersed housing. At the same time the cost of the buildings themselves will also be greatly reduced due to common walls. In addition there will be a considerable reduction of exploitation costs arising from the higher concentration.

Such apparently rigid aggregate buildings when ideally accommodated to the building site, may give a great variety of composition. This may be achieved by placing individual elements of the aggregate at various heights or the mutual shifting.of the elements at the same level. This will strengthen the deep-seated feeling of "a home of my own" by the concentrated system of building of the individual elements around the inner court. This feeling of "my own home" is most important for societies undergoing urbanization.

The far-reaching adjustment of the structure of the settlements to the topography of the building site will also permit considerable economies in the construction of roads, the development of the area and especially in the layout of green spaces.

Particular emphasis, in this field of site planning, should be placed on the maximum consideration to climatic conditions. Often under-rated it is a factor of great significance in securing proper living conditions.

The information data available here for designers is absolutely insufficient, although it is also of major importance, even at the initial stage of decisions as regards locality. A proper design for an urban lay-out may, for example, secure maximum airiness, even with a great concentration. A building improperly situated in relation to the sun and the prevailing winds can never be properly planned, from an architectural standpoint as regards its protection from excessive heat or lack of airiness.

Irrespective of the building type applied there is no doubt that modern urban building systems should be introduced in gradual stages. The main problems here, as in general are the concentration of building aggregates along green spaces and the proper location, in regard to the latter, of public utility buildings and the elimination of road traffic from the inner area of the estate.

From the necessity to adapt the programme to the existing economic possibilities, there arises the problem of the building of the parts of housing estates, or even of individual buildings in stages.

The starting point would be a nucleus unit consisting of kitchen, sanitary facilities and a living room. Other rooms could then be added gradually, with the advent of requirements and means, up to a full exploitation of the building plot. This proceeding should be forseen in the design in the form of a proper arrangement of individual rooms and other units. For aggregates of buildings such modelling should be applied so that even in the first stages of construction they constitute an entity from the exterior. Further construction would be carried out only from inside around the inner courts. This refers, of course, primarily to the atrium type of building.

Should the construction of whole housing estates be abandoned and substituted by individual private building the latter should also be limited in the number of types foreseen for realisation. At the same time in the plans of housing estates it should be clearly defined on which lots and within what limits the given types should be erected. This would permit the maximum entire realisation, based on the central stocks of building materials and standardised elements. A skilful application of details and colour, and a variety of fencing will, as in the case of whole housing estates, eliminate the monotonous appearance of the aggregates, with its depressing effect on the occupants.

4. In architectural design the trend towards the simplest and lightest constructions is obviously necessary. The building methods applied to multi-storey houses should not be used here. Special simple methods for low-cost, one-family housing, based on local materials, should be applied.

Simultaneously in this type of building, stress should also be laid on standardisation and prefabrication as leading to further economy. This should apply in particular to the standardisation of building sections, construction elements and equipment.

Naturally a prerequisite for industrial production of such elements will be the introduction of a modulus and of a planning grid. This would permit the creation of a base for the industrial production of building elements for stock and the introduction of prefabrication founded on stationary plants for dispersed building or on polygon plants for larger works.

Standard designs must be adapted in their variants to local conditions and the needs of the occupants. The determining factors should be: the size of families; local traditions and customs; climatic conditions; the building materials available in the particular region; the desired standards of finishing and equipment and the working capacities of enterprises.

The vast territories, with their widely-varying conditions, in the countries with which we are concerned, may complicate the problem more than under European conditions. In such a case the most rational solution is one based on repetitive designs

according to the standards accepted for the given housing estate. Such designs must also obviously be based to a maximum degree on standardised construction and equipment elements.

For the construction elements of one-family housing we are primarily concerned to elaborate standards for wall elements, in particular those of pre-fabricated concrete and gypsum, ceiling beams, partition walls and slideable scaffolds for cast walls. Joinery should obviously also be standardised, particularly since, in view of the shortage of timber in many of the countries concerned, and the need for protection against termites, it is necessary to substitute timber by metal. Building standardisation should of course be supplemented as far as possible by a standardisation of equipment. This should be carried out if it is possible to a modest degree; it should primarily apply to the standardisation of kitchen and sanitary installations and wall cupborads.

The need for the maximum adaptability of interior lay-outs to the growth of families and the speedy evolution of social structures has already been emphasised. This gives rise to the possibility of substituting partition walls, where possible by wardrobe sets and shelves.

The great potential for economy in building inherent in this seemingly minor factor of standardisation appears to have been under-rated.

A small flat must, of course, be suitably furnished. The production of modern, light, inexpensive furniture will permit the full exploitation of the new interiors and make possible a further economy in buildings and building sites. This however is a separate problem.

5. There is no doubt that in some countries a shortage of qualified personel makes difficult an analysis of, and the discovery of a solution for all the above-mentioned issues. It would in addition be highly uneconomical.

A solution of the problem requires the introduction of models, derived from comparative analysis and taking into account: geographical situation; climate, national tradition, social structure; the degree of economic development and the resources of manpower and materials. Each country, or region of a country would need to be assigned to a sector determined by the similarities of the above-mentioned factors. Norms based on exhaustive survey of each model would then be elaborated in each sector.

These models would serve the states of the sector with solutions for their problems; they would point to the most economic means and prevent the many errors which are liable to arise by the incidental methods now prevailing.

This work could be undertaken by appropriate international institutes organised with U.N. aid. They would cooperate with each other and, naturally, with the local building institutes of their own country. The latter would be required to provide the basic materials and to make the final adaptation of the proposed models for the individual needs of their country.

Obviously the proposed institutes would not be only technical in character: they would also be required to carry on fair-reach-

ing, demographical, sociological and economic studies.

The results obtained from such an approach might be expected to be of a significant, universal scale. Have we not already witnessed the momentous influence of, for instance, circular huts and light, tropical techniques and the wide-spread acceptance there of spontaneous staniardisation on the ultra-modern designs in countries with the most highly-developed technique.

Under the present system individual designers, particularly in urbanistics, often have to fall back on their own experience since there is usually a lack in a given country of planning organisations or of institutes able to provide comprehensive, analysed, collective and tested data on which to base norms. Control by local administration bodies is usually confined to preventing excessive expenditure and to enforcing the simplest building regulations.

6. . The above-mentioned difficulties, particularly those of manpower and materials, make it imperative to dispose the execution of national housing programmes over a number of stages. We may simplify this by reducing them to two stages:

Stage I - the acceptance of all technological solutions which draw on the local labour market and achieve desired effects with a minimum of imports and the greatest possible restriction of investment means.

At this stage the prevailing trend must be towards training workers, while production is in progress, so that they become at least partly qualified and are able to manipulate the more complicated equipment used during the second stage. They should also be trained in more rhythmic work giving increased production and to show a proper psychological approach to their work.

Simultaneously, at this same stage, great emphasis should be laid on the need for the most expert and the most up-to-date town and architectural planning. At the same time the plans must envisage a continued rise in the standard of equipment, both for whole estates and single structures. There should be maximum use of locally-derived materials, exploited on technological lines, continually brought up to date.

Along with the current work of this stage there sould also be arranged:

- studies and research into methods of work, the technology of construction and the organisation of labour;
- intensive training of the medium and more highly-qualified technical staff
- the establishment of an equipment and material base by the gradual expansion of the production of building materials and equipment and of the plants engaged in this. This applies too to the organisation of prefabrication bases.

Stage II - will depend to a larger extent on the overall economic development of the country, particularly on the existence of an adequate industrial base and on the extension and arrangement of an opposite policy of credit and taxes and on

the adaptation the building administration to the extent of requirements and the establishment of an investment organization

The introduction of modern technological methods at this stage must be preceded by a precise and exhaustive recognition of all contributing factors.

At this stage too there should be a thorough revision and re-application of current building regulations which should be elaborated on the most practical lines with maximum adaptation to the conditions of the country. During this period also standards of area and equipment must also be established in relation to whole urban complexes and to single structures. In addition these norms must also, naturally, leave wide room for adaptation.

It is desirable at this stage to elaborate general plans for all the more important urban centres and to sum up their requirements for housing construction.

7. For the further improving of economic building methods a model of the investment organisation should be elaborated supplementing standardisation, both at town-planning level and for single construction.

It is primarily a question of elaborating a model:
- of the available investment organisation, prepared for the realisation of whole estates,
- of maximum-specialised building enterprises, working on their own resources of stationary prefabricating plants for dispersed building, or of polygon prefabrication plants serving larger works.

The above-mentioned plants may also be directly organised by the state and may serve other branches of building. With their importance their distribution should be considered in great detail and will depend primarily upon sources of raw materials for building, the situation of basic building enterprises and of the proposed building sites.

In many of the countries under our consideration building regulations need to be thoroughly revised since in many cases they are based on outworn patterns, not originally intended for them. They form a considerable hindrance to the development of contemporary building. The new building regulations must naturally also embrace the problems of physical planning as the starting point of any form of building activity.

There is an analogous need to reorganise the building administration service which here is also usually run on lines not adapted to up-to-date needs. Such a revision of the administrative side of building into a modern, pliable organisation will also be of significance in improving residential building, particularly of one-family houses. We have in mind here the provision of aid for individual builders.

The establishment of an industrial base must also be accompanied with the training of higher and medium-qualified technical cadres. Here with the pressing demand and specific conditions of the developing countries there should be the optimum combination of studies with current requirements.

In the organisation of studies it is desirable to exploit the experience of countries which have recently gone through a

building period of a new economy and have achieved significant experience in speedy reconstruction and building expansion. Students engagement in current work facilitates the linking of future cadres with the building traditions of their country.

Higher training should be accompanied by an adequate extension of the training of technicians.

With the great expansion of mass residential building, with its prevailing trend of low-cost, one-family houses, the above-mentioned issues are of key significance.

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716 E - Oct.1962 - 1,60